MARCH
1964

WEEDS and TURF

The grass-roots magazine of vegetation maintenance

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Dignitary greets dignitary at the Weed Society of America Meeting last month in Chicago. Secretary of Agriculture Orville Freeman (left) congratulated WSA president Dr. Warren Shaw on a successful conference.

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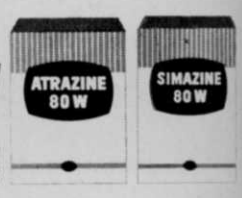

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WEEDS and TURF

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WEEDS AND TURF is the national monthly magazine of urban/industrial vegetation maintenance, including turf management, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.

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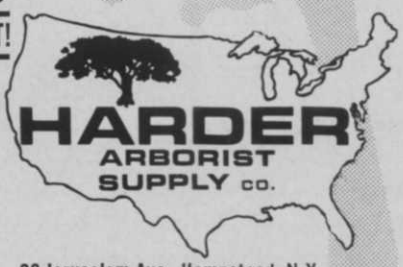

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The Fallacy of Corporate Costs

ONE of our readers, a contract applicator for railways and utilities, was complaining recently that some of his potential customers (particularly railways) do not take all cost factors into consideration when deciding whether or not to have weed and brush control performed by contractors, or by a company-employed crew.

"Many times," our correspondent elaborated, "a railway maintenance-of-way official will look at the quote which contractors supply (a quote that constitutes the *total* costs of the operation), only to compare this figure with how much the chemicals cost if the railway does the work.

Obviously this will form the basis for an unrealistic comparison. Even if the cost of paying crewmen their hourly wages is added, the comparison is still inaccurate. Why?

When a contractor offers to perform weed and brush control for a fixed rate per mile (or acre, or however he computes the task), the cost includes (1) expenditures for chemicals; (2) expense of labor; (3) depreciation of equipment; (4) costs incurred when re-treatment is necessary. This last facet is particularly important, since most CAs guarantee their work.

If a rights-of-way maintenance supervisor is to compare costs intelligently, he must take these same factors into consideration when computing how much it will cost him to do the job himself. This means the cost of paying (and *training*) the crew including the times workmen are kept around when they may not be really needed, must be incorporated. Add to this the dollars spent for chemicals, the amount needed to cover use of equipment, and the "repeat" factor. The "repeat" possibility since the job, if it goes wrong, is now the responsibility of the company, not a contractor, so the cost of re-treating is therefore borne by the company performing its own work.

We've written before about the complexities of cost accounting, but this aspect is particularly intricate. While we're not trying to convince railways or utilities (or anybody else) that they should or should not hire a contractor, we do advocate, in the interest of good business management, that all cost factors be considered when one is trying to decide which weed and brush control program to choose: the self-performed job, or the contracted one. These decisions frequently involve a great deal of money, so the fallacy of corporate costs, the failure to consider all expenses which may be a part of the vegetation control program, can result in ill-advised decisions, and perhaps in a loss of money. In an age of profit-pressures, it becomes doubly important for management to be fully aware of all the costs.

In the event a company is unfamiliar with how such costs can be accurately determined, or if a supervisor is unsure about the possibilities of job failures, we're certain reputable contractors, as well as chemical suppliers, will be happy to help in the judgement of possible influences on costs which are likely to arise in a particular job.

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Update on Terminology

You are certainly to be congratulated on your article "Biology and Identification of Aquatic Weeds." The figures are the best collection of aquatic weed pictures that I have seen.

Your "Guide to Suppliers of Weed and Turf Chemicals" (October '63) should be a very useful feature for your subscribers. Since you make the very commendable effort to distinguish between common names of herbicides and trademarked names, I am sorry to see so many names which are actually common names marked with an asterisk as trademarks.

In connection with a long-standing discussion in our own publication, I am disappointed to see the forms, "pre-emergent" and "post-emergent" used in your influential publication. The form "pre-emergence" was recommended by the Terminology Committee of the North Central Weed Control Conference as early as 1947, and was used almost continually until just recently when there has been a sudden outbreak of "pre-emergent."

I am enclosing a reprint of the Report of the Terminology Committee of the Weed Society of America which establishes the common names of weeds for this country.

C. J. Willard

Editor
Weeds
Columbus, Ohio

We appreciate Dr. Willard's criticisms and comments, and shall make every effort to refine the techniques used in compiling our Supplier's Guide so it contains no inaccuracies. We are also adopting the official Weed Society of America Terminology as the final authority in our verification of spellings, so that there will be a language common to the entire industry. Ed.

Weed Box Helps

I would like to tell you how much I enjoy reading and using the information you publish in *Weeds and Turf* . . . It has been many years since I was exposed to weed identification, consequently I am not familiar with all the weeds we encounter other than the more common ones. Your "Know Your Species" weed cut and control recommendation feature is especially helpful to me even though I have several manuals and books on weed identification.

Holly Mitchell

Landscape Engineer
State of Alabama Highway Dept.
Montgomery

This comment is typical of scores of letters from readers who find the series helpful. We'd like to thank, once again, USDA official Dr. Dayton L. Klingman for his agency's help in preparing these weed boxes. Ed.

Weeds and Turf welcomes expressions of opinions from its readers. Send ideas and comments briefly as possible to Charles D. Webb, Editor, Weeds and Turf, 1900 Euclid Ave., Cleveland, Ohio, 44115.

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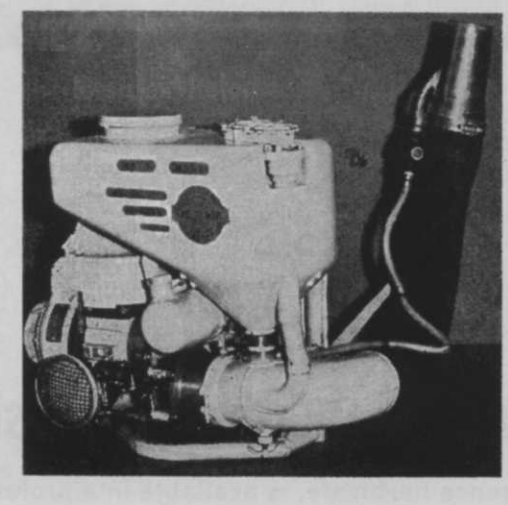

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Making Sense About Crabgrass

By DR. W. H. DANIEL
Turf Specialist, Department of Agronomy
Purdue University, Lafayette, Indiana

READERS of *Weeds and Turf* appreciate the fact that several chemicals are offered for reducing the competition of crabgrass and other annual grassy weeds. Although the "No Crabgrass" millenium is still far away, well-managed areas may be kept free of this weed. This article attempts to characterize and summarize current technology and to aid the reader in developing his program.

The annual infestation of vigorously growing grasses, particularly crabgrass, has for years stymied the homeowner's enthusiasm for improved lawn techniques. Within recent periods, in fact since 1956, the threat of uncontrolled crabgrass has been outdated, because of the availability of nine different basic chemicals in at least 50 formulations. These products are marketed almost nationally so that consumers can choose locally the product they prefer.

The important thing about the above is that this has opened the door to the purse and mind of lawnowners and turf managers so that concepts of producing good turf, free of unwanted competition, now can predominate. For this reason the fundamentals of crabgrass control appeal particularly to readers of *Weeds and Turf*.

First, a modest review of crabgrass itself. Fundamentally its germination is most limited by temperature. Second, its germination is limited by moisture since it germinates primarily only at the surface of the soil. Often the rise in air and soil temperatures during early and midspring is accompanied by wet, humid periods sufficient to produce a dense covering of crabgrass seedlings. Counts of 50 per square inch are modest, and these can occur even in good, dense turf.

The real problem, therefore, in adequate crabgrass prevention is to provide toxic concentrations of a chemical in the surface and in the available soil moisture, so that whenever germination occurs, susceptible crabgrass seedlings are affected by these toxic concentrations and selectively killed. Now, the above sentence shows the importance of total materials used, and time of application.

From the standpoint of the material, this involves the solubility, relative availability, longevity of toxicity, ease of movement with water, type of carrier, and other factors. In rate of application is involved the dilution, uniformity of application, the tenacity of holding onto the carrier, the ease of solubility, and the ability of the material to release the available fraction at toxic concentrations.

Timing is important since prudent scheduling can permit lighter rates of variable solubility materials. For example, calcium arsonate needs to be used right at the critical time because of its ease of solubility. As another example, calcium propyl arsonate moves in the soil solution readily. It can affect seedlings 1″ from the point of application, but most materials would not affect seedlings even ¼″ from point of application.

Good Management Pays Off

Over the years much has been said about the techniques (and tedium) of good management to provide adequate vigor and survival of the desired grass. The 2″ mowing of bluegrass, at least twice-a-year fertilization, the careful timing of weed removal, the avoiding of surface disturbance—all of these things attempt to assure bluegrass and fescue survival. However, under many conditions these are not adequate to keep out crabgrass germination, nor spot survival. Forunately the 50 seedlings per square inch of crabgrass often deteriorate, or die completely if one has the right combination of competition and dry soil surfaces.

Using Crabgrass Preventers

For turf managers the preemergence control of crabgrass opens the door for a better management of turf areas. The consumer without "the blessings" of crabgrass infestation and its masking, quickly finds out how good a turf producer he may be, since many lawns actually need some crabgrass to be considered even summertime lawns. The plagues of fairy-ring, leafspot, foot-rot, brown-patch, drouth, grubs, sodwebworm, plant wear, desiccation, and other ills that may cause browning of turf now assume major proportions in the turf manager's view. It is true that

without crabgrass it's much easier to grow bluegrass or other desired grasses.

We would readily agree that everyone expects the ground to be covered with something by July 4. Therefore, one of the problems of wise crabgrass preventer use has been to indoctrinate consumers with the idea that they should have turf worth protecting before using such compounds.

Over-seeding and Preventer Use

All producers and distributors of crabgrass preventers have faced the dilemma of the consumer's wish to over-seed ritualistically. The habit of over-seeding, so thoroughly ingrained, has raised questions concerning the use of crabgrass preventers. For this reason all companies have needed, but few have had, adequate realistic data on the preferential survival of bluegrass seedlings when crabgrass preventers were used at adequate toxic rate. It is obvious that anybody anywhere can over-seed concurrently with using anything, but the criteria of success is the uniform, normal establishment and survival of seedlings of the desired grass which will contribute to the turf cover. There is a big difference between over-seeding and getting a stand of seedlings. In fact, failure in over-seeding is most common just because people do not keep the seed and seedlings constantly moist. Failure is augmented by competition and by disease, so always it has been a problem to determine the success of such an over-seeding.

A general suggestion, based on observation and understanding of the problem, is that consumers are wise to have turf worth protecting before one decides to use crabgrass preventers. And conversely, if over-seedings are badly needed, then it is suggested that they make their over-seedings as early in the spring as possible. Use crabgrass killers along with weed control during the summer and fall, and be prepared to use crabgrass preventers one year later.

On occasion very early over-seeding, combined with rather late crabgrass preventer use, could be very successful if all goes well. Admittedly these are tediums of management over which manufacturers and distributors often have little control, but they are important to the sales of distributor groups and consumer's satisfaction. Fortunately just the prevention of weedy grass competition, combined with good turf management, gives the consumer a much better chance to maintain the desired grass.

Recommended Rates

Table 1 outlines the several chemicals available and general items concerning their use. With several products there are fringe benefits, such as knotweed control, long-term residual, or better selectivity. For the novice the prime purpose is the prevention of crabgrass competition, and in this area terrific progress has been made and more will be made. The turf manager may be very careful to select the chemical that fits his long-term management program.

Nine compounds are available in numerous formulations for seedling grass prevention. These have been tested repeatedly at numerous experiment stations, and the data resulting therefrom has been quite carefully assayed by the companies producing the basic chemical.

Currently the labeling on most formulations is quite adequate. Nevertheless, one of the real problems with crabgrass preventers is their proper use by the applicator for each individual situation. Table 1 gives chemical designation and comments, and indicates the relative carry-over.

Post-emergence Control

Post-emergence is a useful tool against established susceptible plants—crabgrass, foxtails, dallis grass, sandburs, johnsongrass, and several others. Often crabgrass develops severe competition before killing is achieved. Also any discoloration, burn, or thinning or damage, may weaken the desired turf.

Two applications, good soil moisture, and active growing grasses are desired for best results with the several formulations of popular organic arsenicals.

Turf managers, homeowners, and contract applicators alike now have adequate chemicals to selectively "keep crabgrass out." The need to wisely grow a dense turf becomes even more important in the face of this growing technology.

Table 1. Chemicals and Comments for Pre-emergence Herbicides

Chemical designation	Active ingredient rate lbs.	Residual time	Estimated carryover %	Next season apply	Comments
Zytron	15 A/A	1 season plus	50	.5+	Controls knotweed
Dacthal	10 A/A	2 months	0	full	Quite safe
Betasan	15 A/A	1 season	0	full	Newer compound
Azar	10 A/A	1 season expected	?	?	New in '64
Diphenatrile	30+ A/A	1 season	0	full	Safe on flowers
Trifluralin	1.5 A/A	1 season	0	full	Controls knotweed
Bandane	30+ A/A	1 season	50?	.5+	
Chlordane	80 A/A	1 season	50	.5+	
Lead arsenate	20 F/M	1 season plus	80	.25	Powdery—caution
Calcium ars.	12-18 F/M	1 season plus	75	.25	Granulars preferred
Ca. Propyl Ars.	6.25 F/M	1 month plus	0	full	Fast acting

Diphenatrile and Trifluralin are used together at lighter rates of each. (Even with nine basic formulations of pre-emergence herbicides now available, continued research and additional chemicals can be expected.)

Optimistic Weed Society Sets New Goals, Reflects On Accomplishments at Biennial Meeting in Chicago

A fast-moving and fast-growing Weed Society of America which desires, in this era of scientific revolution, to move ahead even faster, met for its fifth biennial meeting, Feb. 10-13, at the Pick-Congress Hotel, Chicago, Ill.

Seven hundred delegates representing education, research, government, industry, and several foreign scientific agencies gathered to review important research developments of the past two years and to plan for an even more fruitful future.

A baker's dozen of "needs for the advancement of weed science," as this discipline will henceforth be called, was enumerated by Dr. Warren C. Shaw in his Presidential Address at the opening general session. Dr. Shaw is a plant physiologist at the Beltsville, Md., research station for the U. S. Department of Agriculture Crops Research Division. He is Leader for the Weed Investigations phase of crop protection.

"There is a critical need for a better understanding of the ecology, phenology, and botanical aspects of weeds," Dr. Shaw began. "There's a lack of basic knowledge regarding weed seed germination process."

"We need to know more about the chemicals (inhibitors, stimulants, growth-promoting and toxic substances) produced by seeds and roots of plants. There is a gap in our understanding of the herbicidal penetration, absorption, translocation, and movement factors which influence chemical efficiency," he continued.

"We need information on the interacting influences of herbicidal mixtures and combination treatments," he went on. Other areas which are becoming increasingly appreciated, Dr. Shaw pointed out, are in the chemistry of surface active agents (surfactants) in formulations, understanding of herbicidal action mechanisms, and investigation into fate of herbicides in soil and water.

Researchers must continue to consider, according to the WSA President, the interrelationships of effects on plants of treatments with herbicides in combination with insecticides, fungicides and other pesticides.

Secretary Freeman Gets Ovation

Special honor for WSA was the presence of U. S. Department of Agriculture Secretary, Orville L. Freeman, who, after a standing ovation, addressed the group on "Science and Education: A New Awareness." Secretary Freeman's talk centered on the administrator's viewpoint of promising new developments from USDA and some comment on the recent uproar in Senate chambers of the Ribicoff Committee caused by the controversial book, *Silent Spring*.

"Pesticides are a springboard to abundance, but as chemicals designed to remove insects and weeds from our environment, they are always a potential danger," the Secretary stated. "Public discussion has sharpened our awareness of two problems: residues and lingering effect, and the possible misuse at time of application. One can use them properly with confidence." This the secretary described as the basic finding of the Senate Ribicoff Committee.

International flavor was added by the presence of Dr. Wybo vanderZweep (above right), a Dutch weed researcher who compared notes with USDA's Peter Frank (above left). Industry and research met as Diamond Alkali's J. W. Daniel (below left) talked turf with Iowa turfgrass specialist Dr. Eliot C. Roberts.

The position of the USDA has shifted in the past two years, Secretary Freeman observed, now emphasizing nonchemical control methods of harmful organisms. "Where problems must be met, and cannot be met by means other than chemical control, we will find the safest possible techniques for using a pesticide."

As a followup on biological control of weeds with such notable examples as the Klamath beetle on Klamath weed (St. Johnswort), the Cabinet member announced, "a few weeks ago the Department said that a flea beetle which survives only on alligatorweed has passed tests conducted in South America and will be introduced into the Southeast where this weed chokes miles of waterways."

Second honored guest on the program was Dr. Wybo vanderZweep from the Institute of Biological and Chemical Research on Field and Forage Crops, Wageningen, The Netherlands, who discussed some recent advances in European weed control.

Dr. vanderZweep revealed the organization of the European Weed Research Council (EWRC), which is a body of researchers from 21 countries come together to correlate research efforts in their respective countries. "In Europe," the Dutch researcher revealed, "there is a lack of personnel to do research which hampers us, in addition to the language barrier between countries."

European research already has significant accomplishments for which credit is due. Among chemicals which have originated in European laboratories are the dipyridyls, Diquat and paraquat, the triazine compounds, and recently dichlobenil.

Chemist Explains Surfactants

"Surfactants are minor additives to herbicide formulations which can play a major role in toxicant emulsification, wetting, penetration, and in response of plants to treatment," R. W. Behrens, Atlas Chemical Industries,

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Ansul Chemical Company, Marinette, Wisconsin

Wilmington, Del., asserted in his opening remarks on this new phase of herbicidal chemistry.

"Basically a surfactant, which is a shortened form of "surface active agent," denotes 1 molecule with 2 characteristics: one which is attracted to water and the other which is attracted to oils," Behrens explained. Use of surfactants creates an interface between oil and water molecules in an emulsion which keeps emulsions stable longer and increases the activity of the herbicide on the sprayed surface.

With use of properly prepared surfactants, Behrens indicated, herbicide rates can be lowered because there is a much more intimate relationship between herbicide and carrier and surface.

Problems yet to be resolved in the widespread use of effective surfactants are the residues produced and the "biodegradability" (how these chemicals will respond when placed in soils and water supplies).

Due to the broad scope of the WSA program in both agricultural and nonagricultural endeavors, *Weeds & Turf* reporters sifted those developments from the program which should be of most interest to readers.

Tordon, New Brush Killer

Many new chemicals were talked about and researched this year at the WSA meet. Among those was Dow Chemical's Tordon (4-amino-3,5,6-trichloropicolinic acid), a new brush killer. Technical representative Robert Warden described Tordon at a session devoted to discussion of new herbicides from industry.

"Tordon is a growth-regulator herbicide which shows promise for control of woody plants both as a foliage application and as a cut-surface application such as injection and frill treatments. It is also effective against persistent perennial species such as leafy spurge, Russian knapweed, field bindweed and Canada thistle," Warden claimed. It is presently being formulated experimentally as a granular material, a mixture with 2,4-D, and a liquid potassium salt. It is being released to qualified experimenter-applicators for testing purposes.

New Hyvar Bromacil Bows

L. A. Conn of DuPont introduced Hyvar X-WS bromacil

Surfactant expert R. W. Behrens (left) of Atlas Chemical Industries was one of several popular speakers who paused to chat with the new president of the Weed Society of America, Dr. G. F. Warren of Purdue University.

industrial weed killer, a water-soluble postemergent herbicide which does not need additional agitation after initial mixing. Conn said that this herbicide will be available for use by April 1. It has recently received federal registration. DuPont researcher, Linton Cowart, reported that 4 pounds per acre on railroad ballast gives comparable control to sodium chlorate. Ten pounds per acre gave two years of excellent control on railroad ballast.

Another new nonselective weed and brush killer from General Chemical Division of Allied Chem. Corp. is GC-7887. Technically known as hexafluoroacetone trihydrate, this product is intended for use for postemergent control of annuals and perennials and can also be used on certain woody species, according to Roger L. Pierpont, company representative.

Turf Weeds Spotlighted

O. M. Scott & Sons researcher, John A. Long of Marysville, Ohio, presented results with test using dicamba (Banvel D) in turf plots. "Dicamba has given excellent control of red sorrel and white clover at 2.6 lbs. per acre. When used at a 4-lb.-per-acre rate, a wait of only 14 days is necessary before reseeding," Long revealed.

Dicamba can be applied to new stands of bluegrass and Chewings fescue after these plants reach the 4 to 5 leaf stage with no damage. "When used at the 2-lb. rate, workers should avoid application about root zones of ornamentals since these may be damaged," Long cautioned.

"Dicamba can be used at a ½-lb.-per-acre rate on bentgrass to remove white clover, which the dimethylamine salt of 2,4-D will not do, and only a slight temporary discoloration occurs," S. W. Bingham, Virginia Polytechnic Institute, Blacksburg, reported in a second paper which emphasized the usefulness of dicamba.

"Winter weeds, both annual and perennial, can be controlled with paraquat while southern turf is dormant," Carl O. Hanson, California Chemical Co., Ocoee, Fla., said as he presented correlated results of university researchers using paraquat this past year. Although paraquat will kill actively growing turf, it can be used with safety to remove unwanted winter weeds which occur in the dormant grasses. "One pound per acre applied in the spring has provided best control with no damage to centipede grass or Tifgreen Bermuda," Hanson related. He cautioned against use of paraquat on St. Augustinegrass because it has exposed aboveground stolons which may be affected even when dormant. When this technique of winter lawn renovation is used, the applicator should spray to wet the undesired foliage and not to drench the whole lawn. Ortho Division of California Chemical expects an early registration of paraquat for this use.

New Herbicide Concept Brewing

A new look at herbicide use through stunting of plants with a compound produced by biological organisms, such as Penicillium molds, was presented by the discoverer, Dr. Reed A. Gray, formerly with Merck Sharp & Dohme and now working with Stauffer Chemical Co., Mountain View, Calif. A compound called hadacidin is the active ingredient in a broth extracted from cultures of fermenting molds made of *Penicillium* spp.

When this broth is sprayed onto plants, it stunts their growth and with sufficient concentration will kill plants. The compound, however, does not have a desired selectivity, but the principle of control emerging from this new possible control compound excited many of the research delegates.

Machines De-Weed, Renovate

"Machinery can help renovate

(continued on page 23)

ANNOUNCING

A New Selective Pre-Emergence Herbicide for Crabgrass Control

AZAR*

It Combines Effectiveness, Persistence, Turf Tolerance, Low Toxicity, Economy, and Substantially No Odor

Azar* is a new carbamate herbicide for pre-emergence application to control crabgrass. Applied before crabgrass season, it acts to prevent germination and initial growth. Azar is recommended for use only on established lawn or other ornamental turf, at the rate of 10 lbs. of active compound per acre.

ADVANTAGES

Azar is effective for crabgrass control at an economical rate of application. It is persistent enough, does not evaporate or readily leach out of the soil, so that one application can be effective all season long.

Most commonly planted turfgrasses, once established, are tolerant to Azar at the recommended rate. These include red fescue, bent, common Kentucky bluegrass, Merion bluegrass, St. Augustine, centipede, zoysia, hybrid and common Bermudas, and Dichondra.

Based on available data, Azar can be classified as "practically nontoxic" to humans and warm-blooded animals (as defined in "Clinical Toxicology of Commercial Products," Gleason, Gosselin, and Hodge).

Azar has another important advantage in that it is substantially odorless in powder form and in water suspension.

AVAILABILITY

Azar is available this season as an 80% wettable powder, Azar WP-80, which disperses readily in water for use in conventional spray equipment. Manufacturers can formulate Azar WP-80 in granular form, using conventional carriers. For further information write Hercules Powder Company, 910 Market St., Wilmington, Del. 19899, or any Hercules district office listed below.

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BOSTON, MASS.; DALLAS, TEX.; GREENVILLE, MISS.; LOUISIANA, MO.; MONTGOMERY, ALA.; RALEIGH, N. C.; SAN FRANCISCO, CALIF.

Examples of water weed ecological factors which puzzle controllers, and presentation of research developments leading to better controls, occupied 100 members of the Aquatic Weed Control Society meeting at Chicago's Palmer House, Feb. 11-13. Two days of its schedule was in joint session with the aquatic section of the Weed Society of America biennial conference at the Hotel Pick Congress, also in the Windy City.

Major emphasis placed on ecology and ecological shifts (vegetative successions) in waters of the Northeast, Midwest, and Western irrigation systems

Questions were exchanged freely by aquatic weedmen. Noted aquatic applicator Bernard Domogalla (center) and his assistant Rene Weber (right), quizzed Geigy rep James Flanagan about his firm's herbicides.

Fact-Seeking Aquatic Weedmen Stir Up More Questions Than Answers at 1964 Chicago Meet

brought to light many examples of problems confronting controllers regularly.

Leading a trio of experts who presented peculiarities of their regions was Jason Cortell, Consulting Biologist, Brookline, Mass.

"A pond is a body of water which has its littoral (edges) and limnetic (open water above the light penetration level) zones more highly developed than the profundal (deep cold water without vegetation) zone; whereas a lake, properly defined, has a greater profundal zone," Cortell explained, answering questions as to why New England has so many large "ponds."

Lake studies conducted by Cortell attempt to show what happens to the flora of a lake or pond after chemical treatment has been applied.

Preliminary results of this study indicate that there are transition stages of plant growth following chemical applications. First species which becomes dominant in most cases after treatment is the notably resistant *Nitella*, an algae that resembles higher plants.

Nitella, Cortell feels, is a balancing influence in a treated water body and remains dominant until flowering plants become reestablished. To date, the *Nitella* succession or shift is the only pattern Cortell has been able to detect. Secondary reestablishment does not seem to follow a noticeable pattern, Cortell revealed.

Ponds Change Without Chemicals

Over a three-year period, Dr. Robert C. Hiltibran has observed ecological shifts in several ponds near Urbana, Ill., where he teaches at the Ill. Natural History Survey.

In one pond, Hiltibran noted a shift from watermilfoil and *Najas* sp. growth through a mixture-stage of watermilfoil, sago pondweed, *Najas* sp., and *Potamogeton* sp., finishing in 1963 as mainly *Potamogeton* spp. and sago pondweed *(P. pectinatus)*. Watermilfoil was dominant in 1960, and *Najas* sp. was dominant in 1962. Shifts such as this without the "aid" of chemicals require more knowledge of the innerworkings of water bodies, Dr. Hiltibran feels.

A shift, similar to Cortell's *Nitella* succession, was noted by Dr. Hiltibran in another study involving control chemicals. In this midwest pond, the dominant plant, after chemical removal of a complete crop of *Potamogeton crispus*, was *Chara* sp., an algae related to *Nitella*.

The following year, according to Dr. Hiltibran, plankton algae were active (in bloom) all summer and by fall there were no weeds found in the pond. "Nature through turbidity and algae growth often cleans up lakes and ponds," Dr. Hiltibran stated, but no experts can explain the details of this phenomenon.

A delegate from the floor commented that even when only a small portion of a pond may be treated, the results are sometimes complete control over the whole pond. This appears not to be a result of chemical diffusion, but rather a "snowballing effect" of dead weeds killing more weeds. This likewise was not explained.

"Part of the ecological problem with aquatic weeds in western irrigation systems is the type of soil the channel is dug

Brains were pooled by a trio of smiling experts. Dr. Duncan McLarty (left) from Canada exchanged views with Floridian Dr. Lyle Weldon (center) and Massachusetts consultant Jason Cortell.

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through," Delbert Suggs, U.S. Department of Interior, Bureau of Reclamation, Ephrata, Wash., declared.

"Although many canals are 80 miles long, we find most ecosystems do not exceed 12 miles," Suggs continued. An ecosystem in water is a relatively stable environment of interacting organisms and inert chemical elements. Suggs indicated that canal soil conditions change in both composition and direction ("grain") and tend to cause changes in ecosystems.

"We find highest weed infestation in canals dug in loam soils. Slowest infestation occurs in soils with 50% silt loam," he stated.

"Sago pondweed will infest a new canal at the rate of 3 to 4 miles per year," he added, defining the major weed problem in irrigation canals. Sago grows singly and in floating mats which clog filters and sprayers in watering systems.

Warmed up to these strange twists in aquatic weed control, delegates were very attentive to subsequent sessions dealing with less practical, but equally important aspects of aquatic weed control.

Diquat Continues to Prove Useful

Potamogeton species, previously listed as hard to kill, have shown in tests conducted by Dr. Hiltibran to be susceptible to diquat at 0.5 and 1.0 ppm (parts per million).

Some of the susceptible species are: *P. pectinatus*, *P. crispus*, *P. foliosus*, and *P. pusillus*. American pondweed, *P. nodosus*, was not damaged by surface applications of diquat, according to Dr. Hiltibran.

Northern watermilfoil, white water buttercup, and coontail also succumb to 0.5 ppm of diquat, but regrowth of elodea occurred even at the 1 ppm rate, the Illinois expert's work showed.

Fifty millileters of diquat in 1 gallon of water was effective on several emergent weed species when applied as a foliage spray. Among susceptible species are common arrowhead, waterwillow, creeping water primrose, and cattail.

Related diquat research by James R. Whitley, Missouri Conservation Department, Columbia, showed that Pithophora filamentous algae can be controlled with ½ ppm of the diquat cation.

Public health aspects of aquatic work were discussed by C. Mervin Palmer (left), a health official from Cincinnati and new Society president Charles P. Bolster of Pennsalt, Philadelphia.

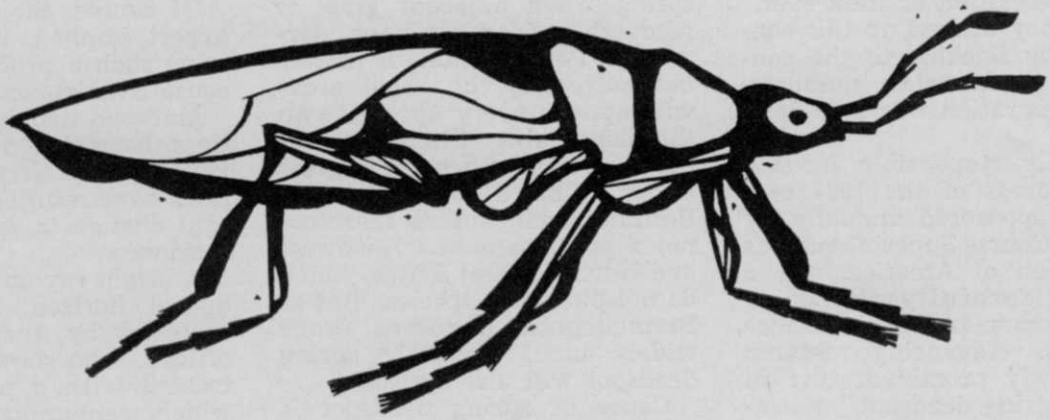
A significant piece of research from the Plantation Field Laboratory, USDA Crops Research Division, in Fort Lauderdale, Fla., shows that Amitrole-T applied to a parent waterhyacinth is translocated through connecting stolons to the offshoot plants. This is something which 2,4-D will not do. Researchers involved in this work are Drs. J. W. Conner (deceased), Lyle W. Weldon, Robert D. Blackburn, and Donald E. Seaman. Work was done in cooperation with the Army Corps of Engineers and Florida Flood Control Districts.

After testing with Amitrole-T, results showed that the greater mobility of this compound accounted for excellent control and less regrowth than when 2,4-D was used. If fenac is added to the Amitrole-T, a faster topkill of waterhyacinths results.

Bolster New President

At the business session of the Aquatic Weed Control Society, presided over by President Henry P. Carsner, Northwest Weed Service, Tacoma, Wash., new officers were elected. New president is Charles P. Bolster, Pennsalt Chemicals Corp., Philadelphia, Pa. First vice-president is Kenneth M. Mackenthun, U. S. Public Health Service, Cincinnati, Ohio. E. Victor Scholl, Modern Weed Control, Grand Rapids, Mich., is the 2nd vice-president. Secretary-treasurer for the group next year is Albert Lopinot, Illinois Department of Conservation, Litchfield.

President Bolster told *Weeds & Turf* that the next meeting of the Aquatic Weed Control Society will be at the LaSalle Hotel in Chicago, Feb. 11-12, 1965.



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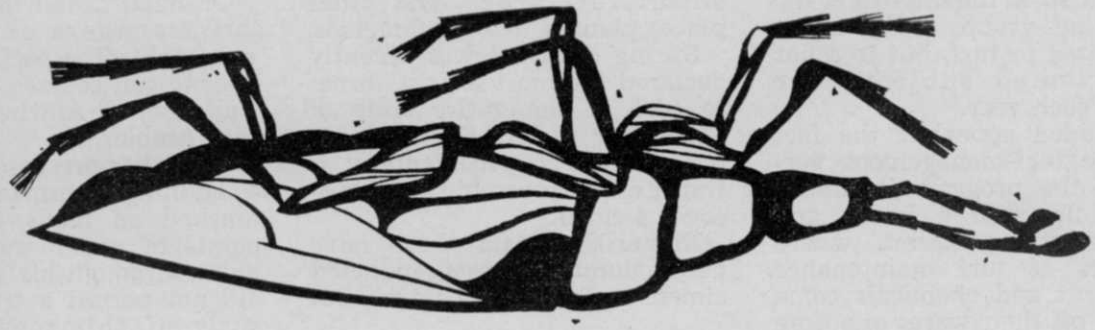

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TECHNICAL CHEMICALS DEPT., NIAGARA CHEMICALS DIVISION, MIDDLEPORT, NEW YORK

Record Crowd of 2755 Delegates Hails Program, Exhibits at 35th International Turf-Grass Conference, Show Last Month

Delegates to the 35th International Turf-Grass Conference and Show in Philadelphia's Sheraton Hotel Feb. 9-14 hailed the yearly educational meeting and trade exhibit as "best ever."

And they backed up this conviction by flocking to the convention in massive numbers; final registration was 2755 delegates.

Partially responsible for the attractiveness of the 1964 conference, sponsored annually by the Golf Course Superintendent's Association of America, was a program carefully attuned to contemporary turf maintenance problems. Advancing research on a newly prominent turf ill called "spring deadspot," a seminar on turf fertilization by a topflight trio of grass nourishment authorities, and a quick review of turf diseases by eminent scientist Dr. Michael P. Britton, were only a few of the well-chosen topics which filled the educational portion of this year's program.

Of course, in the interest of the sponsoring group, many topics not related to turf, but to other golf-oriented subjects, are offered each year.

An added appeal is the fact that the turf-management portion of the program is solidly backed up with a lavish and dazzling trade exhibit, where suppliers of turf maintenance equipment and chemicals come to show off their wares at a time of heightened customer concern with turf subjects.

This year's trade show was no exception to the generally applied epithet, "The greatest show on turf."

Seek Spring Deadspot Cause

One of the most intriguing addresses in the two half-day sessions devoted to turf technology was an address on spring deadspot by Stan Frederiksen, Distributor Products Manager for Mallinckrodt Chemical Works, St. Louis-based producers of turf fungicides.

Frederiksen, who's Industry Chairman for the 1965 Turf Show, has researched spring deadspot for some time; he delivered his findings in an illustrated lecture which succinctly outlined the definite facts presently known about the ailment.

Spring deadspot is characterized by circular brown areas which do not green up in the spring when adjacent grass is recovering from winter dormancy. Peculiar thing is that, if not corrected, the same areas will appear every spring, with the lamentable difference that the dead regions are apt to grow larger. The disease attacks Bermudagrass, and is therefore not a problem in the Northeast and North Central States, which do not plant this species. But as Bermudagrass becomes more widely used, obviously spring deadspot will also spread.

Cause of spring deadspot is undiagnosed, and actual nature of the deficiency is unknown; it is not known whether insects are responsible, a fungus disease, some incorrection in maintenance, or some completely unknown factor. Besides attacking golf courses, the mysterious lesion has shown up in lush lawns, airport turf areas, and other places planted to Bermudagrass.

Spring deadspot was recently declared the most serious threat to turf in the entire state of Oklahoma (where the state experiment station, incidentally, is frantically researching to discover a cure).

Frederiksen said there have been a number of tests conducted aimed at finding a control, but most such tests, until recently, were inconclusive. Fungicides and insecticides were tried, and at one time dieldrin seemed to be helping.

Aquatic weed control was explained by Amchem's John Gallagher.

Of course, the St. Louis turf expert implied, it's difficult to solve such a problem when the cause is unknown.

Mat- and thatch-removal practices have failed to help, and variations of fertilizer applications have resulted in no significant change in spring deadspot incidence.

A bright ray on this otherwise dismal horizon, however, was sketched by the Mallinckrodt official, who showed tests plots treated with a new compound which went unnamed. Preliminary tests are promising, and when more evidence is gathered, the name of the product, and the results of the test, will be released, Frederiksen told a *Weeds and Turf* reporter in a post-lecture interview.

Discourse on Aquatics

On hand to tell the assembled turf managers about aquatic weed control, especially as it relates to golf courses, was John E. Gallagher of Amchem Products, Inc., Ambler, Pa.

Gallagher presented slides and a running commentary which touched on many of the high points of water weed management, although his allotted time did not permit a truly detailed study of this most complex subject.

The Amchem scientist reviewed several prominent pest weed species, and said that the maintenance of chemically harmless (either to crops or people) water is a moral responsibility of everyone who works in aquatic weed control.

Control of aquatic weeds is a far more extensive activity than most people realize. The U. S. Army Corps of Engineers, for example, spends one million dollars every year to control alligatorweed alone. Alligatorweed is a species quite troublesome in the South.

Equipment was pictured, and such spreaders as the Gandy-type, an agricultural device, was recommended.

Gallagher also said helicop-

easy turf and weed control—

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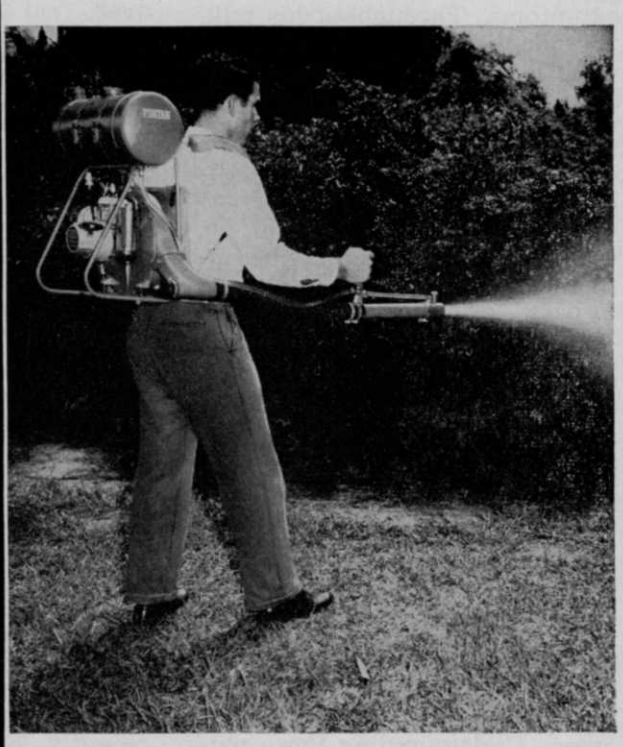

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ters will play increasing roles in weed control in the future.

Scanning the Diseases

With Gallagher on the program was Dr. Michael Britton of the Department of Plant Pathology, University of Illinois, Urbana.

A noted authority of turfgrass diseases, the Illinois scholar presented an orderly slide review of typical turf ailments and their symptoms. Throughout his talk, the scientist insisted that disease control, through the application of fungicides, is best carried out on a preventive basis, since once the disease is evident, damage frequently has already been done.

In the case of snowmold, for example, fungicides *must* be applied before snowfall, since the disease forms under cover of snow and doesn't become evident until thawing occurs.

Probing the Causes of Wilt

Another discussion of singular importance to turfgrass managers was a review of research into the causes of wilt, presented by Harry W. Meusel, Superintendent, Yale University Golf Course, New Haven, Conn.

Meusel's highly detailed studies involve microscopic analysis of the paths water takes when distributed through blades of grass. Understanding these patterns, Meusel feels, will help to discover maintenance practices which will alleviate the wilting problem in fine turf.

So far the Connecticut turf expert has found that phenylmercuric acetate with a nonionic wetting agent is useful in helping prevent wilt.

Heavy watering and fertilization in conjunction with a wetting agent has also proved helpful. Sometimes wilting can be caused, in part, by compacted soil, conceivably because of shallow root systems which exist in such packed-down areas.

Avoiding Ravages of Winter

Last winter's inordinate severity has made turf managers more cognizant than ever of the damages wrought by cold, snowy, windy weather, so the resumé of winter damage problems presented by Alexander M. Radco was most welcome.

Radco is Director, Eastern Region, U. S. Golf Association Green Section, and does his research at Rutgers University, New Brunswick, N.J.

Damages which occur in winter range from rodent problems (burrowing animals) to inundation caused by melting snows.

One way to alleviate the latter, Radco said, is to remove a strip of the sod and dig a ditch through which water may run off. The turf which is removed is placed somewhere else to grow, and can then be replaced when winter is over.

Weather and Insects

An adjunct to the winter damage study was offered by John C. Schread, a Professor of Entomology from the University of Connecticut Agricultural Experiment Station in New Haven.

Professor Schread's observations about Japanese beetles and the chinch bug were particularly notable. Theoretically, a temperature of 15° F. will kill Japanese beetles, but because snow layers protects the pests even when they're near the soil surface, there are recorded instances of survival of even −28° F.

In his discussion of the effect of weather on insect infestations, the Connecticut entomologist said that the chinch bug is adversely affected by heavy rainfalls in late June or early July. This applies, of course, to the Connecticut area, which until recently did not number the chinch bug among its important turf pests.

"Since 1960, however, the chinch bug has been a major pest in turf in Connecticut—in lawns, parks, and other large turf areas," the professor proclaimed.

Fertilizer Trio

"Understanding Fertilizer Behavior" was the theme of another half-day session, in which a trio of turf-feeding specialists discussed the rudiments of their field of interest.

The ecology of nitrogen breakdown was explained by Dr. Roy E. Blaser from the Department of Agronomy at Virginia Polytechnic Institute in Blacksburg, Va.

Dr. Blaser hastened to warn that overstimulation with nitrogen had increased other problems in turf maintenance. For example, grass heavily fertilized with nitrogen produces more thatch, increases the wilt hazard, and ups the weight of clippings.

Nevertheless, nitrogen is the key to quality control in turf, the Virginian commented.

Role of other major elements in turf nutrition (phosphorus and potassium) was examined by Dr. Marvin S. Ferguson, National Research Coordinator, USGA Green Section, Texas A&M College, College Station, Tex.

"You can't depend on deficiency symptoms to indicate when and how much to feed the turf," Dr. Ferguson said, "because it will be too late and the damage will have been done."

It is therefore important to understand the mechanics and technicalities of turf fertilization so proper feeding can be carried out continuously.

Along this line of thought, delegates were told that they should be able to tell the pH of the soil in every green, and if not, should take a soil test to determine the factor. Why? Because the acidity or alkalinity of soil affects the availability of trace elements such as boron, copper, iron, etc.

This observation was part of a talk on trace elements by Dr. J. R. Love, Department of Soils, University of Wisconsin, Madison.

"A cold wet spring may herald iron deficiency," Dr. Love indicated in his catalog of tips on trace-element management.

The other educational sessions of the 35th International Turf-Grass Conference and Show were given over to matters affecting golf course people only. Next year the meeting will be in Cleveland, Ohio, at the Sheraton Cleveland Hotel, January 31-Feb. 4.

New Name for Ansul

Stockholders of the Ansul Chemical Company voted recently to change the corporate name to The Ansul Company, it was just reported.

In addition to chemicals, the Marinette, Wis. firm also manufactures tanks, pumps, and related equipment for fire fighting and other uses; refrigeration components, and other products.

Ansul spokesmen predict significantly higher sales gains in 1964, as a result of, among other things, the development of the company's "Ansar" line of herbicides.

Weed Society Report
(from page 14)

established turf by removing much of the weedy plants which produce a running type of growth, and machines can aid also when one wants to completely kill all grass and start over," Dr. William H. Daniel, Purdue University agronomist, Lafayette, Ind., indicated in his talk on the usefulness of dethatching machines.

"Often after turf is killed with cacodylic acid or a urea formaldehyde solution, the thatch (that layer of dead stems and leaves over the soil) ruins the opportunity to reseed because it prevents seeds from reaching the soil," Dr. Daniel explained.

"Removal of thatch beforehand with a machine will permit seeds to contact soil and produce a more healthy stand," the agronomist feels.

Dethatching machines, as Dr. Daniel pointed out, can also produce a more healthy stand of grass if stoloniferous weedy grasses, such as goosegrass, creeping bent, and chickweed are removed with a machine. "Considerable thatch, mat, and old clippings can be loosened, then swept up," he concluded.

Dybar Used For Right-of-Way

"Mechanical control of rights-of-way with saws and axes only postpones problems, and increasingly dense regrowth makes greater problems later for us," Charles P. Aho, Public Service Co., Division of Commonwealth Edison, Chicago, Ill., pointed out in the brush control session.

"We've found fenuron pellets (Dybar) to be very satisfactory for woody plant control along power lines to keep down large brush. It is better than liquid toxicants for us because it is cleaner, lighter, effective, economical and can be applied in wind and rain," he cited.

"We have lines in our area which are as far as two miles from roads. Chemicals must be packed in, since we use hand labor for selective control," Aho explained. "Here is where we find the pelleted formulation handiest."

"On rights-of-way through suburban areas, care must be exercised to avoid damage to desirable shrubs and trees. Fenuron pellets applied on one brush species can damage a nearby tree if the tree is on the downhill side and leaching will carry toxicant to its roots," he cautioned.

Part of Commonwealth's lines run through the Cook County Forest Preserve and Aho indicated that selective control with fenuron avoided problems of drift to forest trees and enabled workers to keep low-growing shrubs while eliminating higher growth that interferes with power lines.

Warren Succeeds Shaw

At the banquet of the Weed Society of America, new officers were installed. Dr. Warren C. Shaw, Crops Research Division, USDA, Beltsville, Md., handed the presidential gavel over to Dr. G. F. Warren, horticulturist of Purdue University, Lafayette, Ind.

The new president-elect is Dr. William R. Furtick, Oregon State University, Corvallis.

Weeds & Turf was advised that the last biennial meeting of WSA will be held Feb. 6-11, 1966, at the Sheraton Jefferson Hotel in St. Louis, Mo. Beginning in 1967, meetings will be annual.

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NEW DROP TOX MALATHION

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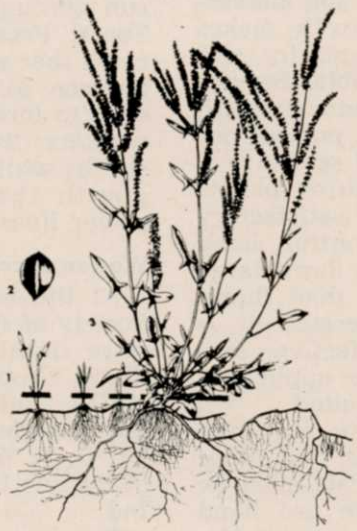
Know Your Species

RED SORREL

(Rumex acetosella)



Red sorrel, (1, 3) also called sheep sorrel and sourgrass, is a perennial which reproduces by seeds and by sprouts from shallow, but extensive, creeping roots. It is common throughout the United States and southern Canada.

Not easily confused with dock, also in the genus *Rumex*, red sorrel has arrow-shaped leaves (sagittate) with broadened basal lobes. Leaves are smooth, and rather thick, about 1 to 3 inches long. Sorrel stems usually grow to about 10 inches high, but may grow to a height of 18 inches.

Leaves begin to grow in the spring and form circular rosettes on dry, sandy, or gravelly soils. Soils favorable to red sorrel growth are generally acid (low pH). It also thrives on neutral or slightly alkaline soils, especially if soils are low in nitrogen. Plant tissues are sour to taste. This is why the weed is called sourgrass, sourweed, etc.

Sorrel is thought to be an indicator of acid conditions in the soil. It gives warning that grasses may not thrive. Such soils should be limed according to soil tests to promote vigorous growth of turfgrasses.

Male and female flowers are found on separate plants. Small flowers bearing male parts (pollen) are described as yellowish-green, whereas female flowers (seed producers) are reddish. Flower parts are borne on short branches (racemes) terminally on upright stems. Seeds (2) are between 1/16 and 1/32 inch long, three-sided, reddish-brown, and glossy.

Jointed roots are shallow but extensive. New stems are sent up intermittently from joints.

Since red sorrel is "acid-loving" and desirable grasses are not, sorrel will have an advantage on poor soils. Liming to relieve acidity will restore turf vigor. Proper fertilization with nitrogen will help eliminate red sorrel by producing healthy turf. Most desirable pH for lawn grasses is neutral (pH 7).

Herbicidal controls for lawns infested with red sorrel consist of several applications of 2,4-D before plant maturity. Of course, red sorrel will succumb to spot applications of any of the more powerful contact herbicides. Especially effective for selective control is dicamba (2-methoxy, 3,6-dichlorobenzoic acid) (Banvel D) as a foliage spray, but it should not be used where ornamentals are grown in adjoining beds.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.
(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

Azar, Hercules' New Herbicide, Called Safe, Effective, Cheap

A new selective preemergence herbicide for crabgrass control said to offer the unique combination of economy, effectiveness, and safety, has been developed by the Hercules Powder Company.

Called Azar, the new aid to professional turf experts will be available as a wettable powder easily dispersed in water. It is practically nontoxic to humans and warm-blooded animals, Hercules says.

Lawn turf of red fescue, bent, Bermuda, dichondra, common Kentucky blue, and Merion blue grasses are, under normal conditions, tolerant to Azar at the recommended rates of application, company spokesmen report. Azar was identified as "9573" during the evaluation program.

Tests indicate that for best results Azar should be applied to established turf before crabgrass germination in the spring at the suggested rate of 10 lbs. active compound per acre as a spray or in granular form.

Of especial interest is the claim that Azar gives seasonal control with one application, and that it is effective even if applied several months prior to crabgrass germination.

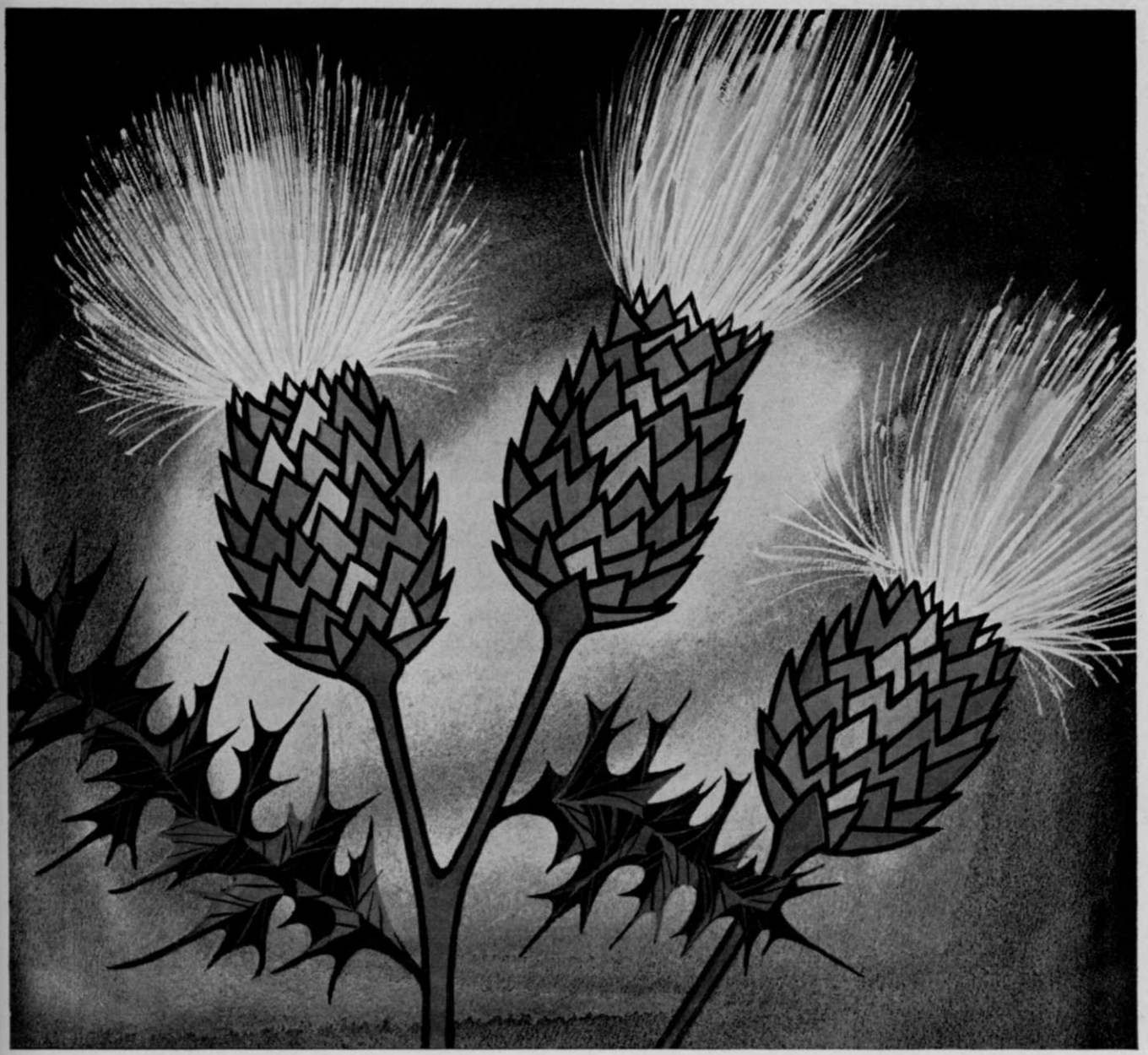
More information about this new product is available from Hercules Powder Co., 910 Market St., Wilmington, Del.

Residex Releases '64 Catalog

A new catalog and price list describing a complete line of products for the professional vegetation manager has been announced by the Residex Corp., according to Richard E. Sameth, sales manager for the Clark, N.J., formulator.

Residex reports it has a complete line of insecticides, herbicides, and brush killers. Also included in the Residex line of products are compression sprayers, mechanical and thermal aerosol generators, and other application equipment.

A copy of the 1964 Residex catalog may be obtained by writing to: Residex Corp., 225 Terminal Ave., Clark, N.J.



KILL CANADA THISTLE WITH HOOKER SODIUM CHLORATE

After more than 35 years of weed killing, it's *still* the most effective chemical for destroying such pests as Canada thistle, bindweed, Johnson grass and Russian knapweed.

Hooker sodium chlorate reaches deep into the soil to kill germinating seeds and growing roots—and goes on working for months.

Costs little. For only 25¢, you can sterilize 100 square feet of drainage ditch, fence line, or roadway for a year or longer.

Fast-opening drum has a single lever that opens and reseals the drum with a metal band. Full-open head makes pouring, scooping, or shoveling easy.

Available in drums of 50 and 100 lb. net.

Technical aid. Our full-time agronomists can help you with weed-control plans and advise on handling, storing, and using sodium chlorate.

For descriptive folder, please write HOOKER CHEMICAL CORPORATION, 40 Buffalo Avenue, Niagara Falls, New York. *Sales offices:* Boston, Buffalo, Chicago, Detroit, Los Angeles, New York, Niagara Falls, Philadelphia, Tacoma.

HOOKER CHEMICALS® PLASTICS

AGRICULTURAL CHEMICALS

Third Florida Turf Show Set Apr. 30-May 2 in Miami Beach

A tour of turf research plots and a full-fledged demonstration of new turf maintenance equipment is in store for delegates to the annual Florida Turf-Grass Trade Show in Miami Beach's Hotel Seville April 30 through May 2.

Spokesmen for the third yearly affair, co-sponsored by the Horticultural Spraymens Association of Florida and the Florida Society of Golf Superintendents, say the public will be invited to join turf professionals during the Saturday sessions.

Opening day will be spent at the Plantation Field Laboratory in Ft. Lauderdale, inspecting test plots and witnessing equipment use.

For more information, write to Walter D. Anderson, Executive Secretary, Florida Turf-Grass Association, 4065 University Boulevard North, Jacksonville 32211.

Heritage House Puts Dyrene In New Homeowner Fungicide

A new lawn fungicide containing Chemagro's Dyrene has been introduced in a small package line by Heritage House Products, Inc., manufacturers of consumer turf products.

Readers with retail outlets who desire more information on the new HH fungicide, or on other Heritage House products, may write the firm in the Gulf Oil Bldg., Pittsburgh, Pa.

Spra-Boy, a new power sprayer said to handle most any job from lawn and garden to trees up to 20 ft. high has been introduced by the H. D. Hudson Mfg. Co. Details will be sent to readers who write the firm at 589 East Illinois St., Chicago 11, Ill.

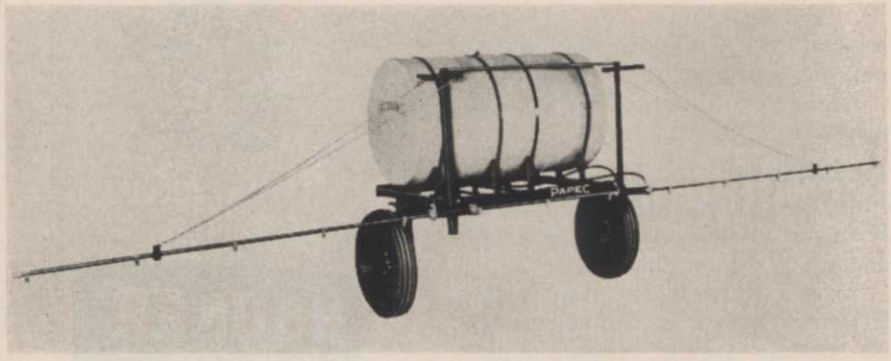
Use Dormant Spray for Scales, Maryland Expert Advises

Scale insects that damage woody plants can best be controlled by spraying in the dormant season, before the blossom and leaf buds open, Ted Bissell, University of Maryland entomologist, reminds vegetation maintenance personnel.

Scales are given away by a crust, on the bark, of circular, oysterlike (or terrapinlike) shells, about 1/16 to 3/16 inch in diameter.

On apple, cherry, elm, oak, pyracantha, and taliptru, use superior dormant oil in water at the manufacturer's recommended rates.

Don't use oil on beech, blue spruce, Japanese maple, walnut, or Douglas fir, Bissell cautions.



New improvements in Papec Field Sprayers include a polyethylene tank on a trailer model, plus redesigned chain anchors on booms to provide uniform support, regardless of boom height, and increased length to reduce sway. Adjustable booms are available in 20 ft. sections of copper, aluminum, or of angle iron, each with a 40" extension. For more information on the new sprayers, write to Papec Machine Co., Shortsville, N.Y.

Meeting Dates

Iowa State Univ. Turfgrass Conference, Iowa State Univ., Ames, March 10-12.

34th Annual Michigan Turfgrass Conference, Michigan State Univ., East Lansing, March 12-13.

3rd Annual Florida Turf-Grass Trade Show, Hotel Seville, Miami Beach, April 30-May 2.

American Society of Landscape Architects Annual Convention, Hotel Baker, Dallas, Tex., June 28-July 1.

International Shade Tree Conference, Shamrock Hilton Hotel, Houston, Tex., August 15-21.

National Agricultural Chemicals Assn. Annual Convention, The Greenbrier, White Sulphur Springs, W.Va., Sept. 8-11.

Midwest Regional Turf Field Days, Purdue Univ., Lafayette, Ind., Sept. 14-15.

Society of American Forestors Annual Meeting, Hilton Hotel, Denver, Colo., Sept. 27-30.

New Betasan Kills Crabgrass in All Lawn Grasses, Stauffer Says

A new selective herbicide called Betasan is said to give excellent preemergence control of crabgrass in all types of lawn grasses including Bermuda and dichondra, according to Stauffer Chemical Co., which developed the compound.

A single application gives all-season-long control, and the chemical offers the widest margin of safety of any commercial product tested, Stauffer claims.

Betasan, in both concentrated liquid and granular forms, is now available throughout California, and is expected to be marketed nationally very soon.

While initial California labeling specified control only of smooth and hairy crabgrass, the 1964 list of weeds controlled has been greatly expanded. Included among weeds controlled, Stauffer says, are redroot pigweed, watergrass, lambsquarters, shepherdspurse, goosegrass, deadnettle, and even annual bluegrass.

For more information, write the company at 380 Madison Ave., New York 17, N.Y.

Cite Increasing Tree Service Sales as Arborists Gather for Annual Winter Meeting in Fla.

For eight of the past 10 years, average annual increase of tree service sales by members of the National Arborists Association has paralleled growth of such things as the U.S. mean national income, number of households in the country, and construction value of new dwelling units, a marketing expert told delegates to the 13th Midwinter Meeting of the NAA in Ft. Lauderdale, Fla., Jan. 13-14.

Assembled at the resort town's Galt Ocean Mile Hotel, arborists heard New York City business consultant Ralph Head detail the rate of growth, and future potential, which has characterized the tree industry in recent years.

While the growth rate in the last two years has fallen slightly off among NAA members, it is felt that future sales increases will offset this pattern, especially in light of an aggressive advertising campaign which the NAA is expected to approve shortly.

Head recommended arborists develop more aggressive advertising and sales promotion, and Dr. Paul E. Tilford, NAA Executive Secretary, reported his group is devising a plan which will furnish members with advertising mats for local newspapers, and is considering a limited advertising program in national magazines to promote the association emblem, which designates a firm "member of the National Arborists Association."

In other membership surveys, Dr. Tilford reported that most NAA firms offer fringe benefits for employees, sometimes running into an expense as high as 70-75 cents an hour. It was recommended that managers make employees aware that this high expense should be considered a part of the worker's total income.

Increasing use of different makes of aerial lifts and cranes used in tree work, particularly in line clearance, take-downs, and in planting trees in difficult locations, has prompted the NAA safety committee, chaired by Edward C. Shearer of Farrens Tree Surgeons, Jacksonville, Fla., to develop a "safe practices code" for using these devices. Shearer will present these practices to NAA members at their next meeting.

NAA holds two meetings annually, and the next gathering will take place during the International Shade Tree Conference set for Aug. 16-21 in Houston, Tex.

New directors for southern weedmen. Here is the new executive committee which will guide the Southern Weed Conference through the coming year. Left to right, front row: Dr. Dale Wolf, duPont; Dr. R. E. Frans, new prexy, Univ. of Ark.; R. F. Richards, Geigy; Henry Andrews, Univ. of Tenn.; back row: James Taylor, Thompson-Hayward; Dr. E. H. Funderburk, Jr., Auburn Univ.; Dr. J. R. Orsenigo, Everglades (Fla.) Experiment Station; Jesse Harris, Niagara Chemical; and Dr. Don E. Davis, also of Auburn.

Dixie Weed Problems Topic for Record 700 at Southern Conclave

A record attendance in excess of 700 delegates at the annual Southern Weed Conference was justified by a program of variety and timeliness, and a special orientation to problems of weed control peculiar to the South.

Meeting at the Hotel Heidelberg in Jackson, Miss., Jan. 15-17, the assembled weedmen had as their 1964 theme "weed control in cotton." While much of the program was strictly agricultural in nature, there were many papers of interest to those involved in nonfarm weed control on rights-of-way and in turf.

One of the keynote speakers, Denis Hayley, described at the outset how pesticides, particularly herbicides, have come to play so important a part in American life, and how the public is misguided by many figures who voice concern over chemical weed and pest control. Hayley is Director of Information for the National Agricultural Chemicals Association of Washington, D.C.

Said Hayley: "The Public Health Service credits pesticides with saving the lives of 5 million people and preventing 100 million illnesses each year."

Furthermore, the NACA spokesman continued, FDA samplings of total diets of the U. S. populace show without doubt that the food consumed by American families is completely safe and is not being poisoned by pesticides.

Brush Control at TVA

Among the papers on nonfarm subjects of interest to urban/industrial vegetation management personnel was a paper jointly prepared by John R. Aldred and R. A. Mann of the Tennessee Valley Authority in Knoxville, Tenn. The TVA officials described methods their agency

employs for brush control on transmission line rights-of-way.

Basal or dormant treatment was adopted by TVA for brush control in 1954 after several years of research work.

Dormant treatment is used primarily to eradicate resistant species after one or two foliage applications. "The results are highly satisfactory when applied at any time of the year," the Tennesseeans disclosed. "With due caution, this method virtually eliminates the possibility of crop damage."

A mixture of 3% esters, containing 4 lbs. of acid per gallon, and 97% diesel oil is applied to the brush about 4 inches above the ground line permitting the mixture to run down and thoroughly wet the root collar. Also, the scientists said, any exposed roots should be wet.

This method is effective on resistant species, such as ash, maple, and elm. When conifers appear in the course of dormant treatment, it is best to wet the entire plant.

The method described by the TVA duo will not effectively eliminate lateral sprouters, such as sumac, locust, and sassafras.

Substituted Urea Usage

In another brush control presentation, Texas A&M College researcher Dr. G. O. Hoffman explained his studies on the effectiveness of substituted urea herbicides.

Both powder and pellets of fenuron, monuron, Urab, and Urox were tested. It was concluded that fenuron pellets, applied at 1 tablespoonful of pellets per square yard, effectively controlled such woody plants as post oak, elm, pine, slat cedar, sweet gum, hickory, hackberry, and others.

Hoffman reported that monuron and Urox pellets work satisfactorily on mesquite and huisache, but they produced considerable soil sterilization and the material needed constant agitation to remain in suspension.

Reviewing the Arsenicals

A second look at arsenical compounds, which, while highly effective, are often subject to abuse by the public, was offered by researcher P. J. Ehman of The Ansul Company, Marinette, Wis.

Dr. Ehman, who heads the Wisconsin firm's research department, presented a number of tabulations and test results to show that pentavalent organic arsenicals used as herbicides have a very limited toxicity and are not harmful when used properly.

He also pointed out the difference between organic arsenicals (in general, less toxic to man) which are showing promise as herbicides and the inorganic arsenicals, which are considerably more toxic.

Dr. Ehman observed that evidence is being developed which shows that specific arsenicals in low dosages are nonaccumulating in animals similar to man in arsenical metabolism.

Alabama Turf Tests

In the sections devoted to weed control in turf, a highlight was the paper presented by R. W. Couch, a graduate student in botany at Auburn University in Auburn, Ala.

Couch's studies have shown that there is no injury to Bermudagrass from 2,4-D used at 2 lbs. per acre, or 4 lbs. per acre of silvex, DMA, or monoammonium methanearsonate.

Both 2,4-D and silvex gave excellent control of catsear, with 2,4-D causing more rapid kill. These two were also effective against yellow woodsorrel and cudweed, but not against carpetgrass and dallisgrass.

Delegates found time to elect officers for the coming year and to agree on meeting dates for 1965. In charge until the next conference is Dr. R. E. Frans, an agronomist from the University of Arkansas, who was elected president replacing R. F. Richards of Geigy Chemical Corp., Ardsley, N.Y. Dr. Dale Wolf of duPont was chosen vice president, and the new secretary-treasurer is Henry Andrews, a researcher from the University of Tennessee.

The 1965 Southern Weed Conference will be held Jan. 19-21 in Dallas, Texas.

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HELP WANTED

OUR COMPANY is now operating in termite and pest control. We wish to expand into weed control, turf maintenance, tree care, etc. If you qualify to form and manage this new department, kindly give education details, experience, reference and personal data. Write Box 512, Havertown, Pa.

Triple-Action CHLOREA® GRANULAR

MOST POWERFUL WEED & GRASS KILLER

A dry, granular combination of 3 proven chemicals . . . for use around buildings, storage yards, parking lots, fences and other areas where complete, long-lasting control of weeds and grass is needed. Requires only 1 to 1½ pounds per 100 square feet . . . easily applied by hand or with mechanical spreader. Saves labor . . . improves maintenance . . . prevents vegetation fire hazard.

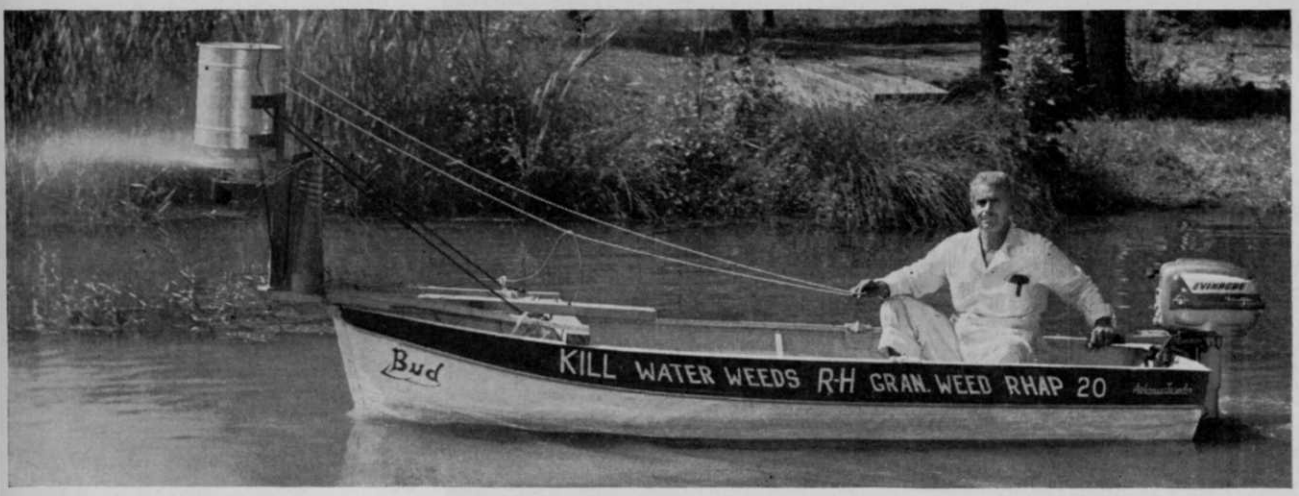
1 SURFACE KILL
Soil surface action kills shallow-rooted weeds and grasses; also prevents seedling growth.

2 SOIL STERILANT
Long-lasting residual action stops growth for at least a season; usually much longer.

3 SUB-SURFACE KILL
Chemical penetrates deep in the soil . . . kills deep-rooted perennial weeds and grasses.

Ready to Use
Easy to Apply
Economical

Send for Free Sample and Circular . . . **CHIPMAN CHEMICAL CO.** Dept. 7, Bound Brook, N.J.



CYCLONE MODEL 20 HAND SPREADER. For fast, precision spreading of pelleted and granular chemicals; also seed. Galvanized hopper holds 3 gals. or approx. 20 lbs. Covers a 6- to 8-foot swath with most materials. Feathered-edge spread prevents streaks and double overlaps. Shield protects operator.

Cyclone

MODELS FOR LAND AND WATER FOR HERBICIDES, FERTILIZERS, SEED

The Cyclone Electric Model shown on boat, above, also mounts on garden tractor or front or rear of large tractor, truck or jeep. Powered by a self-contained electric motor which operates from the electric system of the vehicle upon which it is mounted. Models also available which operate from heavy duty, flexible drive shaft which fits tractor PTO. Double agitator, easy setting rate gauge, and positive shut-off. Spreads up to a 30-foot swath, depending on material being spread. 1-, 2½-, 3- and 5-bushel sizes. Time and money savers that can put many extra dollars in your pocket.

See your distributor or write for further information

THE CYCLONE SEEDER CO., INC.
Urbana 36, Indiana

CYCLONE LAWN SPREADER. Famous for speed, freedom from streaks, accuracy. Ideal for fast, precision spreading of pelleted and granular fertilizers, herbicides, insecticides, seed, ice melters, etc. Covers a 6- to 8-foot swath. Feathered edge spread to prevent streaks and double overlaps.

Design "Professional" Package for Diamond's Dacthal W-50

Dacthal W-50, Diamond Alkali Company's preemergence herbicide, is now available in 24-lb. packages for convenient use by professional turf management personnel, nurseries, and other bulk applicators.

Dacthal controls annual grasses and broadleaf weeds, including crabgrass.

The 50% wettable formulation was highly successful in comprehensive tests conducted throughout the country, at federal, state, and private research facilities, Diamond claims.

Dacthal also offers compatibility with lawn food, and safety for desirable turf, ornamental shrubs, trees, and flowers, the company maintains.

Applicators wishing more information about the new professional formulation and package may write to the Diamond Alkali Company, Agricultural Chemicals Div., 300 Union Commerce Bldg., Cleveland, Ohio 44114.

PROBLEM . . . SOLUTION . . . RESULT!

What's more unsightly than a dead tree stump in a lovely lawn? There was a time when removal meant days of laborious and expensive chopping, sawing and digging by a crew of men to remove a big stump like the one shown above.

And then came Vermeer, with a revolutionary new stump removal machine. Look how the machine's big, high-speed revolving cutting wheel has ripped half the stump to chips—as it moved back and forth across the stump.

Now see the difference! Stump has been removed. Hole has been filled with dirt and chips —ready for seed or sod. All accomplished in minutes by one man . . . and a Vermeer Pow-R Stump Cutter.

Here's the machine acclaimed by cities and tree service men everywhere for fast, low cost stump removal!

VERMEER'S Pow-R Stump Cutter

available in 5 models to fit every stump removal problem

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Please send complete descriptive literature on your complete line of Pow-R Stump Cutters.

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VERMEER POW-R-LINE PELLA, IOWA

VERMEER MFG. CO.

SC 42

1583 West Washington • Pella, Iowa

You'll save thousands of dollars and man-hours annually with a Vermeer Pow-R Stump Cutter. There is a model to fit every need—to remove an occasional small stump . . . or hundreds of stumps every week! Thousands of Vermeer Pow-R Stump Cutters have been used extensively in cities and towns in every state . . . and in many land clearing, highway widening and construction projects. Praised by municipalities as a tremendous labor and money saver—and by tree service firms as an invaluable profit-maker! Simple 3-lever hydraulic control system lets one operator remove large stumps in minutes. No back breaking labor. It's the modern, economical way to remove stumps. Ruggedly built to give years of satisfactory service with minimum of low cost basic maintenance.

VERMEER . . . WORLD'S LARGEST STUMP CUTTER MANUFACTURER

Trimmings

Arboreal urban renewal. Does the arborist play a part in urban renewal? Absolutely! We were sidewalk-superintending the construction of Cleveland's new downtown skyscraper, Erieview Plaza, recently when we noticed a crew, some trees, and a truck from the Charles F. Irish Company moving onto the scene. The Irish firm operates both in Detroit and Cleveland, we learned, and this particular crew, under foreman Earl Socia, was from the Detroit office. They'd journeyed all the way to Cleveland to install 52 sugar maples around the lengthy pool which will reflect this new skyscraper from a landscaped plaza of several acres. Unable to chat very long with our new acquaintance, since everyone looked very busy and official, we still couldn't help but note the efficiency with which the crew was planting the large maples, which will surely be a source of comfort on hot days next summer!

* * *

What's my lime? *News from a Wisconsin conference of fertilizer and lime dealers is that someday computers may "gobble up soil test results" and automatically report the proper amount of lime and fertilizer to use on lawns, trees, and various crops. We trust these machines will be impartial in their recommendations, and that they'll lay it on the lime without fear of disagreement from more human judges of soil needs!*

* * *

Two nursery experts get life. Two Floridians, both expert horticulturists, are currently enjoying the first year of lifetime honorary membership in the Florida Nurserymen and Growers Association. Dr. J. R. Beckenbach, director of the University of Florida's Agricultural Experiment Station, and Mark B. Jordan, vocational agricultural leader at the Florida State Prison, were so honored not too long ago. Dr. Beckenbach was cited for his work directing the ag station, and Jordan for his rehabilitation of prisoners through horticultural vocation training. We congratulate both on notable achievements!

* * *

Booze in the blight. *What next? A communiqué just crossed our desk which indicates that alcohol, in moderation, may help defeat one of the most widespread and devastating enemies of crop production in the world, a root rot fungus known as armillaria mellea. Apparently experiments with ethyl alcohol at the University of California reveal that a few stiff belts during the growing season can do much to give the fungus DT's, or at least speed the ailment towards extinction. Barring any unforeseen developments, this might make some farmers more cordial towards use of alcohol, although we suppose it will be necessary to offer adequate proof that the technique is truly deserving of our cheers!*

WEEDS!

a menace to everyone / profits for you

There's money in weeds, if you're on the right side of them. And that's with any of the many Du Pont weed and brush killers. They make custom weed control jobs easy and effective. Check the typical problems below; chances are you'll see at least half of them within a mile of where you're standing. ■ The answers are easy, too, because Du Pont has a product to meet almost any weed control situation you'll encounter.

THE PROBLEM:
Hard-to-kill perennials —Johnson grass, Bermuda grass, nut-grass and quackgrass.

THE ANSWER:
Efficient, long-term control of vegetation with HYVAR® X bromacil weed killer, an entirely new organic herbicide.

THE PROBLEM:
Rampant weed growth in storage areas causing fire hazards as well as wood and metal deterioration.

THE ANSWER:
A single application of KARMEX® diuron or TELVAR® monuron weed killers provides effective, low-cost control of weeds and grasses for a whole season.

THE PROBLEM:
Deep-rooted perennial weeds—morning glory, leafy spurge, Canada thistle and others.

THE ANSWER:
Easier control of noxious weeds than ever before with TRYSBEN® 200 weed killer. Also controls some woody plants.

THE PROBLEM:
Undesirable growth of brush on plant sites, roadsides, drainage ditches, rights-of-ways.

THE ANSWER:
Economical control of brush with non-volatile, AMMATE® X or with DYBAR® fenuron weed and brush killer.

Only a few examples of the type of situations that mean opportunity for you are shown above. Product descriptions are necessarily brief, too—each of these Du Pont herbicides effectively control many other kinds of weeds or brush. For complete information mail the coupon to Du Pont today.

On all chemicals follow label instructions and warnings carefully.

DU PONT REG. U.S. PAT. OFF. **WEED & BRUSH KILLERS**

Better Things for Better Living . . . *through Chemistry*

Du Pont—I. and B. Dept. WT-34
Room N-2539, Wilmington 98, Delaware

Please send me more information on Du Pont weed and brush killers.

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COMPANY _____

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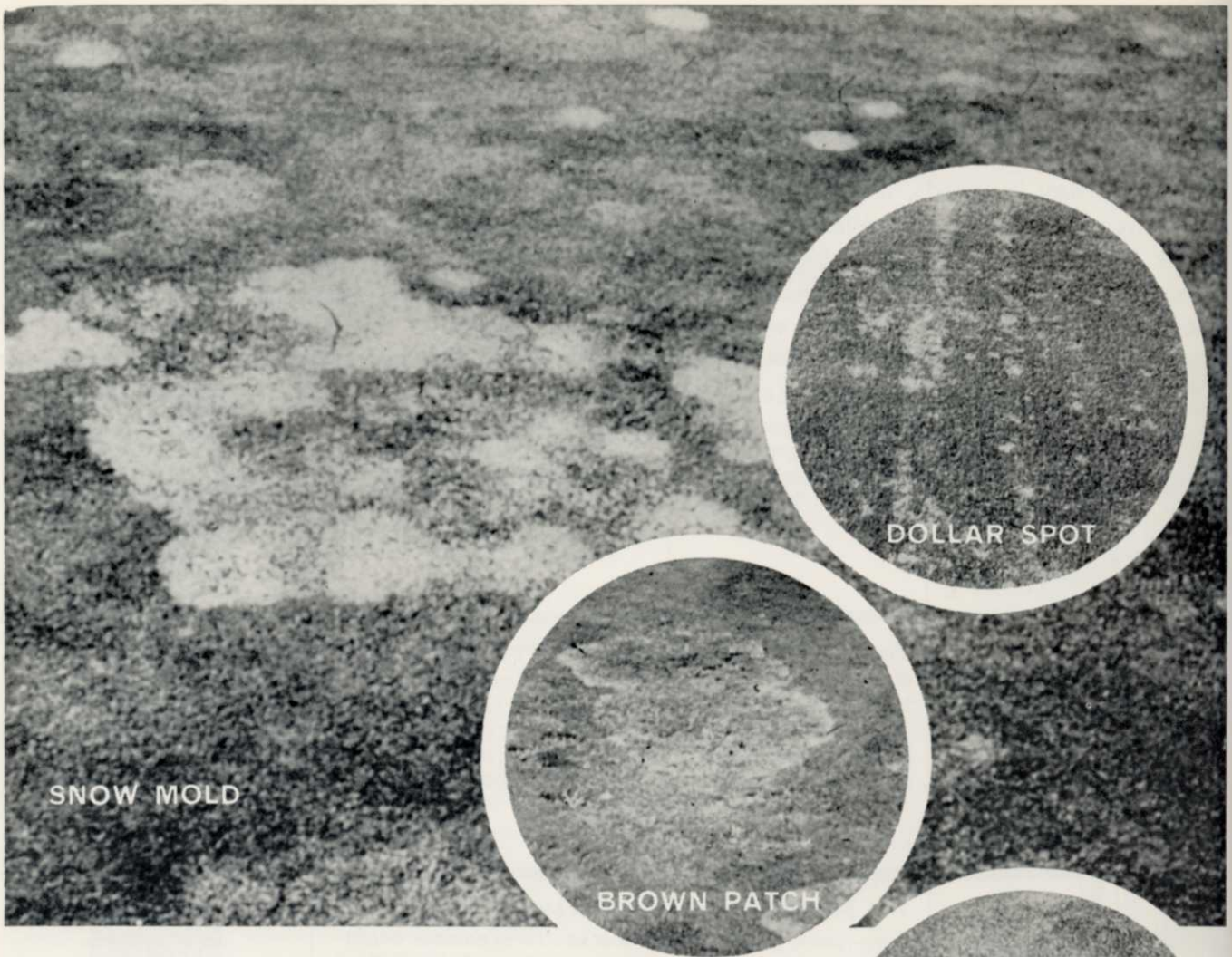
CITY _____ STATE _____



UGLY SPOTS CAUSED BY FUNGAL DISEASE

EASY TO AVOID WITH THIS SPRAY

Fungal diseases such as you see here can ruin a beautiful lawn fast. First, ugly yellow, brown or grayish spots appear. Left unchecked, these diseases destroy vital root systems and spread, killing off large areas of lawn. To prevent such costly damage, simply apply Panogen Turf Fungicide.

This hard-working chemical makes it easy—and inexpensive—only .14 to 28c per 1000 ft. to spray away the danger of fungal disease. Can be used to keep healthy lawns disease-free, or to control an outbreak of fungal disease during early stages. Highly selective; attacks only fungal diseases without injury to turf. A liquid concentrate. Simply mix with water and apply with sprayer. Order from your chemical supplier.

PANOGEN®
TURF FUNGICIDE

Another Peace-of-mind product from . . .

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